

the top of the tube the inner cone is propagated through it and descends until it reaches a stratum richer in gas, when it re-ascends. The fluctuation in the composition of the gaseous mixture escaping from a Bunsen burner can be seen by the throbbing of the inner cone, when the air supply is considerable. I may add that in the construction of burners for the incandescent mantle great importance is attached to the perfect mixing of gas and air, since it becomes possible thereby to have a steady flame with a relatively large quantity of primary air.

The University, Leeds.

A. SMITHELLS.

Gas for Heating and Lighting Laboratories.

I SHALL be greatly favoured if you will inform me which are the best "gas-making plants" for supplying a laboratory with gas derived either from coal, or paraffin oils.

Do you know anyone who has had experience of these? I more particularly incline to those easily managed and maintained, simple and inexpensive.

ALEX. PARDY.

Lynne House, Albyn Lane, Aberdeen, March 7.

If I were fitting up a large laboratory I should put in a small water gas generator and inject paraffin oil into the fuel during the period of steaming, fixing the hydrocarbons in the gas produced by passing through a superheater.

I see in the Journal of the Society of Chemical Industry for February 28 a paper by Masumi Chikashige, who had been fitting up the Kyoto University laboratory with a gas made in this way, and of which he gives the results, which appear to be very satisfactory. In the discussion upon the paper your correspondent will also find some useful hints as to the fitting up of laboratories with heating-gas where coal-gas is not available.

If he should not require enough gas to make a small carburetted water gas plant successful, and if he can get petrol or benzene, he will probably find carburetted air the cheapest thing to use.

VIVIAN B. LEWES.

Royal Naval College, Greenwich, S.E., March 12.

Cooperation between Scientific Libraries.

As this subject has recently been receiving attention in NATURE, it may interest some readers to know that the Royal Society of Edinburgh is taking steps for the purpose of finding out what can be done so far as the south of Scotland is concerned. A committee, of which I am convener, has been appointed by the council, and this committee is at present engaged in obtaining information from the various libraries of Edinburgh and Glasgow. It is hoped that later on a conference will be held, at which suggestions for joint action would be considered, and an endeavour made to draw up a scheme of cooperation for consideration by the various societies and institutions directly concerned.

I shall be very glad to supply information regarding the work of the committee to anyone who is specially interested in it, and also to receive particulars of any similar work which is being undertaken elsewhere.

HUGH MARSHALL.

University of Edinburgh, March 26.

THE PROBLEMS OF GEOLOGY.¹

THIS admirably printed book deserves description rather than criticism, since the author, in his wide range of personal observation and reading, aptly plays the critic to the views that he successively propounds. With an unnecessary assumption of modesty, he apologises in his preface for "the clumsiness of a geologist, who is more at home with the hammer than the pen." We can scarcely believe that one who has tinged even his most serious scientific contributions with the high attraction of literary style

¹ "The Age of the Earth, and other Geological Studies." By W. J. Sollas, D.Sc., F.R.S. Pp. xvi. + 328. (London: T. Fisher Unwin, 1905.) Price 10s. 6d. net.

can in reality know so little of himself. Almost all the papers in the present volume state a proposition and sustain an argument. There is, perhaps, a lighter one, describing a visit to the Lipari Isles; but even this contains a theoretical explanation of a difficult problem at the end. Yet the book is entirely readable, and will serve to bring to workers in all manner of fields the views of one who holds that nothing terrestrial is foreign to the subject of geology.

The papers are of various modern dates, and might, as we venture to think, have been brought nearer to uniformity in the text itself. Corrections are introduced in footnotes; but essays need not be treated as prize-poems, to be crowned with honour, and to remain unalterable. We do not want to read, for instance, that "the boring party is at this moment at work" on Funafuti, when evidence is immediately given that the task was completed seven years back. But this is a matter of pure detail; the scientific considerations put forward are uniformly fresh, vigorous, and inspiring.

The article on "The Age of the Earth" naturally brings us to no definite conclusion, seeing that the data on which a correct judgment depends are still of the scantiest description. A large number of readers, however, rejoice in such discussions; and we even discern grounds for combat when we are asked to believe that the opening of the fossiliferous stratified series lies only twenty-six million years behind us. In the following paper, on "The Figure of the Earth," we are introduced, as general readers, to Mr. Jeans's very recent hypothesis of a pear-shaped primitive earth, and a secondary pear-shaped earth with an equatorial bulge. Lest we should pin our faith to these or any other proposed forms, we shall do well to notice the excellently chosen language in which the author places them before us. In the discussion of the earth's loss of heat, radium is held up to us (p. 63) as "threatening to destroy all faith in hitherto ascertained results, and to shatter the fabric of reasoning raised upon them." Now and again, therefore, we suspect in Prof. Sollas the artist who feels in him a mission to produce and paint, even if in perishable pigments. The pigments are not his fault; they are all that others will provide for him; but the artist in him must find expression, spite of all. After this, dare we revert to the passage in the preface in excuse of "the clumsiness of a geologist"?

The summary of the results of the famous Funafuti boring is very welcome, especially in view of the cautious absence of generalisations that characterised the Royal Society report. It is a matter of regret that von Richthofen should have passed away without reading the authoritative re-vindication of his views as to reefs in Tyrol contained on pp. 131 and 132 of the present volume.

The sixth chapter, on "The Origin and Formation of Flints," should set at rest many fantastic theories still prevalent among amateur geologists. We only wish that the numerous flints of radiolarian origin could have been included in this lucid essay. Zoologists will be especially attracted by the next chapter, on "The Origin of Freshwater Fauna" (faunas?), in which Lake Tanganyika, among other areas, is discussed. William Smith's views on the contemporaneity of similar faunas are defended in "The Key to Terrestrial History"; and an address on "Geologies and Deluges," in which objection is properly taken to Suess's reliance on the Chaldean narrative of the deluge, concludes the varied and uniformly interesting series.

If we accept "planctone"—but would the author write "gnomone"?—the only slips that we notice in this excellent book are in proper names, Burnett,

Huddleston, Birnham, and Mojsisoviks. The quotation from Tennyson on p. 233 has got astray, mainly in punctuation.

In conclusion, we would ask attention to the remarkable *tour de force*, or rather *tour d'esprit*, entitled "The Influence of Oxford on the History of Geology" (p. 219). In this, Plot's work as a "critic" is compared with that of Steno as a "prophet"; Kidd, an Oxford chemist, appears to be regarded as having furnished a serviceable brake to the wheels of Hutton's chariot; while Buckland's abandonment of the Noachian deluge as a geological factor, only to accept several deluges in place of it, is held up as a claim upon our gratitude. Here we think we see Prof. Sollas revelling in his mission as an artist; yet he paints far too frankly, and has no desire to deceive us. The pigments have been made in an

to the great loss the laboratory had sustained by the deaths of Sir E. Carbutt and Sir B. Samuelson.

The report of the executive committee for 1905 was presented and approved for presentation to the Royal Society on the motion of Sir J. Wolfe Barry, seconded by Mr. David Howard. The scheme of work for 1906 was also approved. The report showed progress in all directions.

Some fourteen scientific papers of importance have been published officially, while members of the staff have contributed nine others to various journals.

The second volume of "Collected Papers" is in course of preparation. The scheme of work for 1906 includes a research into the resistance of materials of construction to impact, the continuation of the wind pressure and steam researches, the completion of the work with the Ampere balance, and some experiments



FIG. 1.—The Sella Mass, Tyrol, the remains of a supposed ancient coral atoll. (From "The Age of the Earth, and other Geological Studies.")

ancient university; but we see right through the picture. We still prefer what we may consider as the first draft of this address, a modest pamphlet issued in Bristol in 1883, in which stress is laid on the progress of geological thought rather than on the benefits to be derived from its academic retardation.

THE NATIONAL PHYSICAL LABORATORY.

THE annual meeting of the general board of the National Physical Laboratory was held at Bushy House on Friday, March 16. There were present, in addition to the chairman, Lord Rayleigh, the following among others:—Sir John Wolfe Barry, Mr. Beilby, Mr. Kempe, Mr. R. K. Graye, Colonel Crompton, Mr. Hadfield, Mr. Gavey, and Mr. Howard.

In opening the proceedings, Lord Rayleigh referred

of great interest on the effect of the continued application of high pressure to insulators. In the metallurgical division a research into the properties of aluminium bronze promises interesting results.

The report announced the intention of the Government, communicated to the Royal Society in December last, to grant a sum of 5000*l.* for buildings during the year, and the increase of the annual grant by 500*l.* It referred also to the very successful meeting in the House of Commons last August, under the chairmanship of Mr. Haldane, which led up to a petition, signed by 150 members of the House, asking that the grants should be increased, and the chairman was able to announce that the Chancellor of the Exchequer had recently intimated his intention of making the building grant for the year 10,000*l.* instead of 5000*l.*, as originally contemplated. We are able to add that this increase was largely due to an appeal to the Chan-